

WHAT IS CLAIMED IS:

1. A phase change ink composition comprising:  
a urethane that is the reaction product of one or more alcohols and one or more  
5 isocyanates, the alcohols comprising monohydric fused-ring alcohols; and  
at least one polyethylene wax.

2. The phase change ink composition of claim 1 wherein the isocyanates  
comprise isophorone diisocyanate.

10 3. The phase change ink composition of claim 1 wherein the monohydric fused-  
ring alcohols include one or more of hydroabietyl alcohol, methyl ester of hydrogenated  
rosin, and decarboxylated rosin.

15 4. The phase change ink composition of claim 1 wherein the monohydric fused-  
ring alcohols include one or more of hydroabietyl alcohol, methyl ester of hydrogenated  
rosin, and decarboxylated rosin; and the isocyanates comprise isophorone diisocyanate.

20 5. The phase change ink composition of claim 1 wherein the alcohols consist of  
one or more of hydroabietyl alcohol, methyl ester of hydrogenated rosin, and decarboxylated  
rosin; and the isocyanates consist of isophorone diisocyanate.

25 6. A phase change ink composition comprising:  
a urethane resin that is the reaction product of one or more alcohols and one or more  
isocyanates, the alcohols comprising fused-ring alcohols which include at least three fused  
rings.

30 7. The phase change ink composition of claim 6 wherein the fused-ring alcohols  
consist of monohydric alcohols.

8. The phase change ink composition of claim 6 wherein the fused-ring alcohols which include at least three fused rings consist of monohydric alcohols.

9. The phase change ink composition of claim 6 wherein the fused-ring alcohols include one or more of hydroabietyl alcohol, methyl ester of hydrogenated rosin, and decarboxylated rosin.

10. The phase change ink composition of claim 6 wherein the fused-ring alcohols include one or more of hydroabietyl alcohol, methyl ester of hydrogenated rosin, and decarboxylated rosin; and the isocyanates comprise isophorone diisocyanate.

11. The phase change ink composition of claim 6 wherein the alcohols consist of one or more of hydroabietyl alcohol, methyl ester of hydrogenated rosin; and decarboxylated rosin and the isocyanates consist of isophorone diisocyanate.

12. A phase change ink composition comprising:  
a urethane resin that is the reaction product of one or more alcohols and one or more isocyanates, the alcohols comprising monohydric fused-ring alcohols having no double bonds.

13. The phase change ink composition of claim 12 further comprising a polyethylene wax.

14. The phase change ink composition of claim 12 further comprising a polyethylene wax and a mono-amide.

15. The phase change ink composition of claim 12 wherein the monohydric fused-ring alcohols include alcohols having at least three fused rings.

16. A phase change ink comprising:  
a urethane that is the reaction product of one or more alcohols and one or more  
isocyanates, the alcohols comprising monohydric fused-ring alcohols;  
at least one polyethylene wax; and  
a colorant.

17. The phase change ink of claim 16 wherein the monohydric fused-ring alcohols  
include one or more of hydroabietyl alcohol, methyl ester of hydrogenated rosin, and  
decarboxylated rosin.

18. The phase change ink composition of claim 16 wherein the monohydric fused-  
ring alcohols include one or more of hydroabietyl alcohol, methyl ester of hydrogenated  
rosin, and decarboxylated rosin; and the isocyanates comprise isophorone diisocyanate.

19. The phase change ink composition of claim 16 wherein the alcohols consist of  
one or more of hydroabietyl alcohol, methyl ester of hydrogenated rosin, and decarboxylated  
rosin; and the isocyanates consist of isophorone diisocyanate.

20. The phase change ink composition of claim 16 wherein the alcohols consist of  
one or more of hydroabietyl alcohol, methyl ester of hydrogenated rosin, and decarboxylated  
rosin; and the isocyanates consist of isophorone diisocyanate; the ink further comprising a  
mono-amide.

21. A method for producing a layer of a phase change ink on a surface of a substrate, which comprises:

forming a phase change ink composition in the solid phase, the phase change ink composition comprising a phase change carrier composition and a colorant material; said  
5 phase change carrier composition comprising a urethane resin that is the reaction product of at least one fused ring alcohol and an isocyanate, the fused ring alcohol including at least three fused rings;

melting the ink;

applying the melted ink to at least one surface of a substrate; and

10 solidifying the applied ink on the surface of the substrate.

22. The method of claim 21 wherein the fused-ring alcohols consist of monohydric alcohols.

15 23. The method of claim 21 wherein the fused-ring alcohols which include at least three fused rings consist of monohydric alcohols.

24. The method of claim 21 wherein the fused-ring alcohols include one or more of hydroabietyl alcohol, methyl ester of hydrogenated rosin, and decarboxylated rosin.

20 25. The method of claim 21 wherein the fused-ring alcohols include one or more of hydroabietyl alcohol, methyl ester of hydrogenated rosin, and decarboxylated rosin; and the isocyanates comprise isophorone diisocyanate.

25 26. The method of claim 21 wherein the alcohols consist of one or more of hydroabietyl alcohol, methyl ester of hydrogenated rosin, and decarboxylated rosin; and the isocyanates consist of isophorone diisocyanate.

30 27. A method of forming a phase change ink, comprising reacting one or more alcohols with one or more isocyanates, the alcohols comprising fused-ring alcohols which include at least three fused rings.

28. The method of claim 27 wherein the fused-ring alcohols consist of monohydric alcohols.

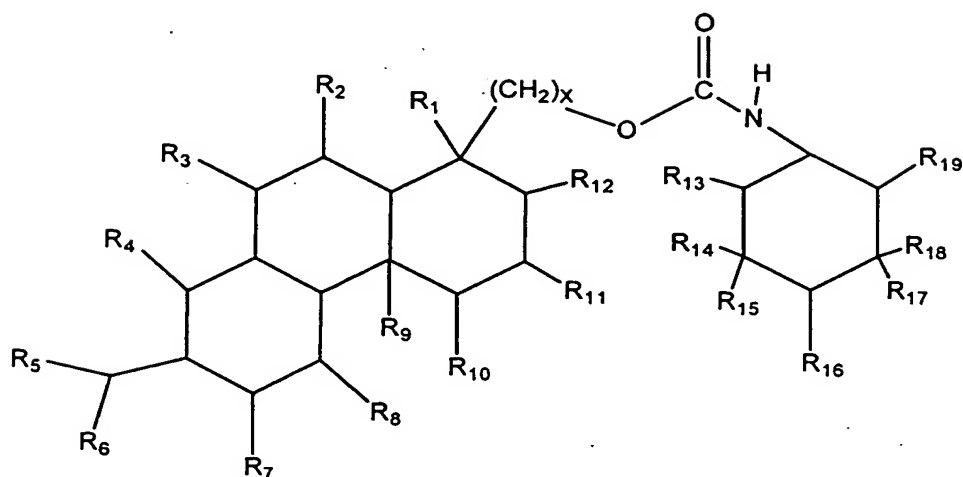
29. The method of claim 27 wherein the fused-ring alcohols which include at least  
5 three fused rings consist of monohydric alcohols.

30. The method of claim 27 wherein the fused-ring alcohols include one or more of hydroabietyl alcohol, methyl ester of hydrogenated rosin, and decarboxylated rosin.

10 31. The method of claim 27 wherein the fused-ring alcohols include one or more of hydroabietyl alcohol, methyl ester of hydrogenated rosin, and decarboxylated rosin; and the isocyanates comprise isophorone diisocyanate.

15 32. The method of claim 27 wherein the alcohols consist of one or more of hydroabietyl alcohol, methyl ester of hydrogenated rosin, and decarboxylated rosin; and the isocyanates consist of isophorone diisocyanate.

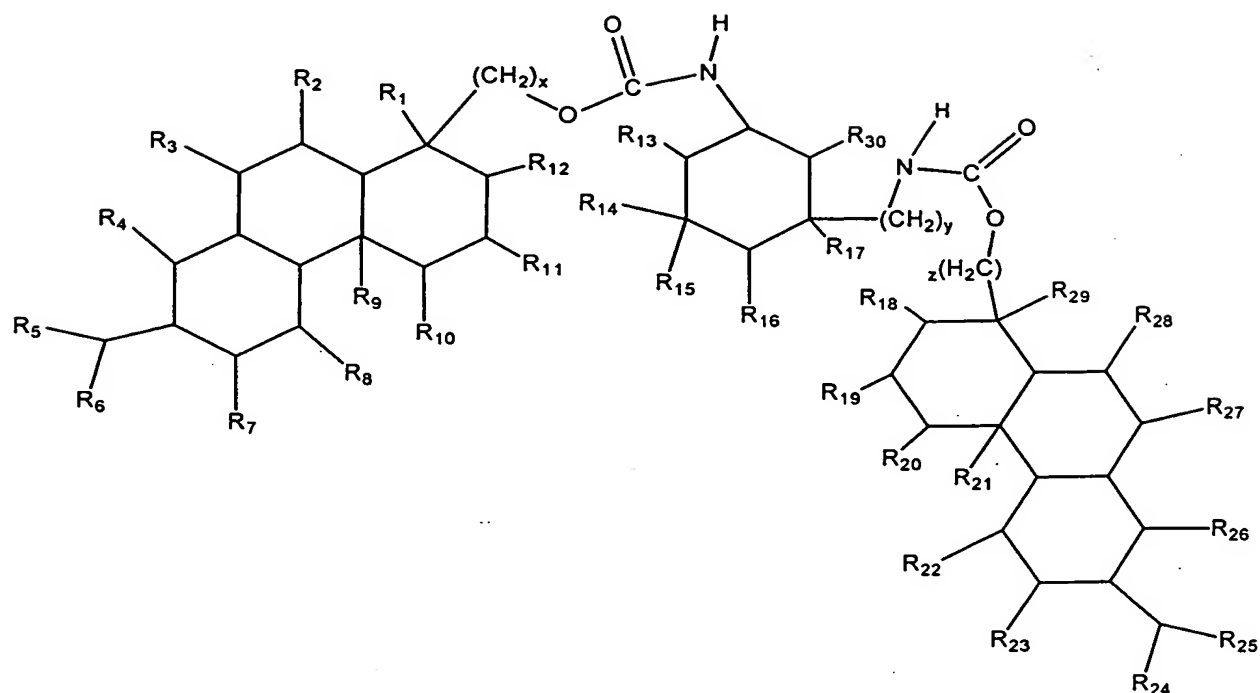
33. A composition comprising:



wherein R<sub>1</sub>-R<sub>19</sub> comprise hydrogen, alkyl groups or aryl groups, and can be the same as one another or different from one another; wherein one or more of R<sub>1</sub>-R<sub>19</sub> can be comprised by a ring structure; and wherein X<sub>1</sub> comprises one or more methylene groups.

34. The composition of claim 33 wherein some of R<sub>1</sub>-R<sub>19</sub> are methyl groups and some of R<sub>1</sub>-R<sub>19</sub> are not methyl groups, and wherein at least some of R<sub>1</sub>-R<sub>19</sub> which are not methyl groups are hydrogen.

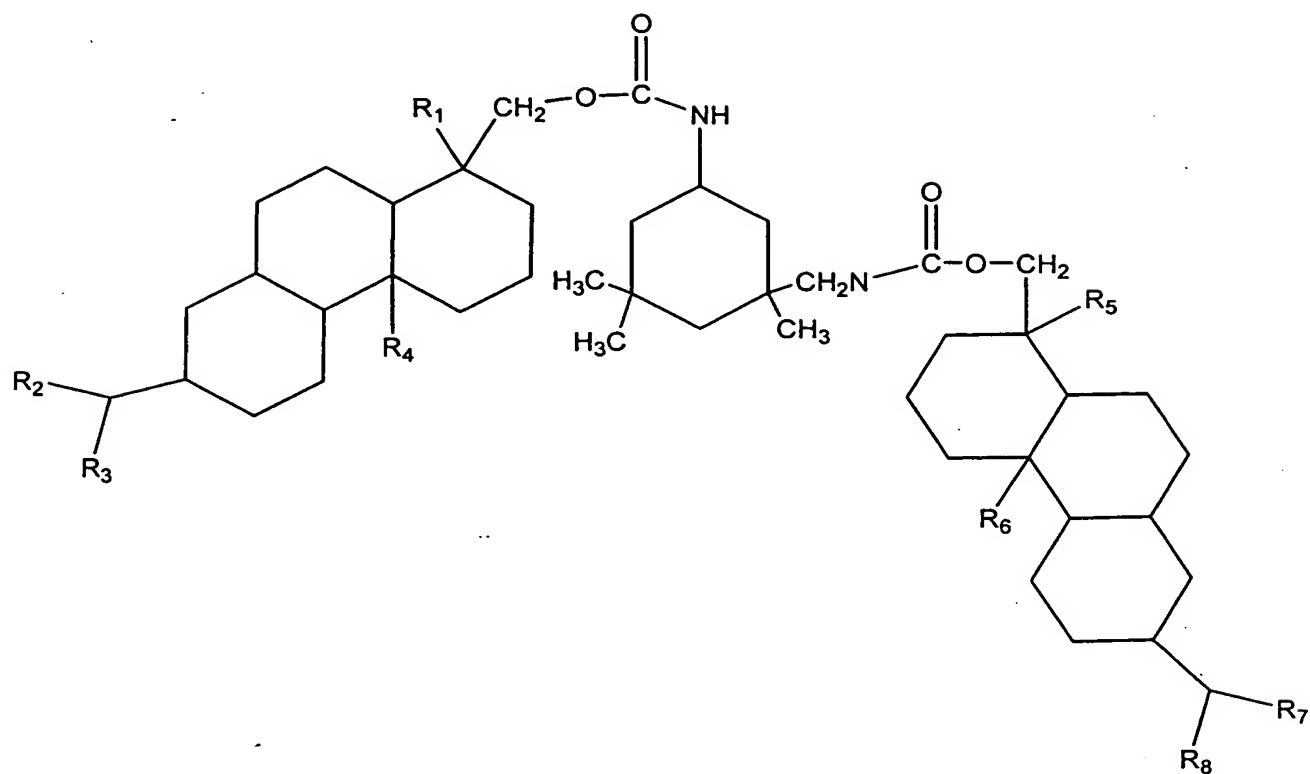
35. A composition comprising:



wherein R<sub>1</sub>-R<sub>30</sub> comprise hydrogen, alkyl groups or aryl groups, and can be the same as one  
 5 another or different from one another; and wherein X<sub>1</sub>, X<sub>2</sub> and X<sub>3</sub> comprise one or more  
 methylene groups and can be the same as one another or different from one another.

36. The composition of claim 35 wherein some of R<sub>1</sub>-R<sub>30</sub> are methyl groups and  
 some of R<sub>1</sub>-R<sub>30</sub> are not methyl groups, and wherein at least some of the R<sub>1</sub>-R<sub>30</sub> which are not  
 10 methyl groups are hydrogen.

37. A composition comprising:



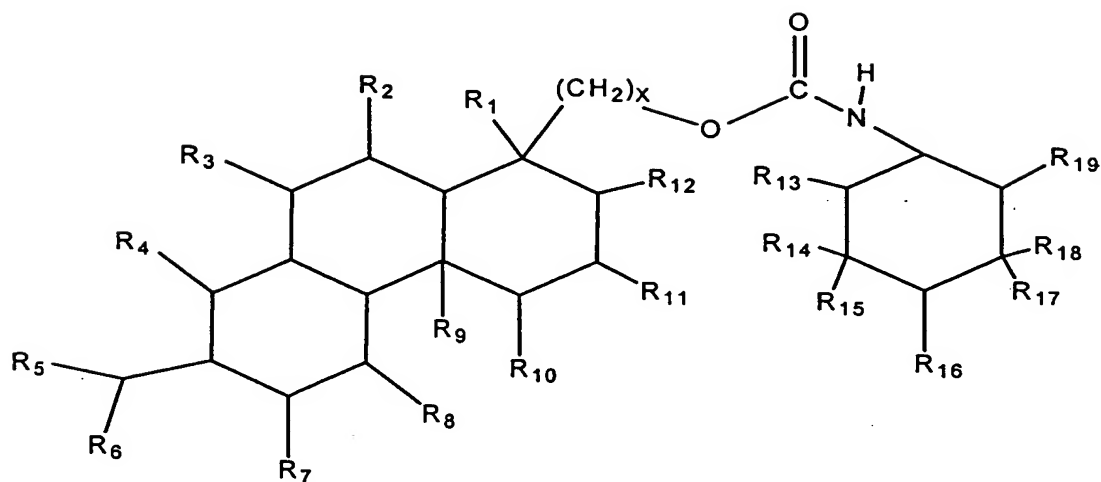
wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub> and R<sub>8</sub> comprise hydrogen, alkyl groups or aryl groups.

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38. The composition of claim 37 wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub> and R<sub>8</sub> are methyl groups.



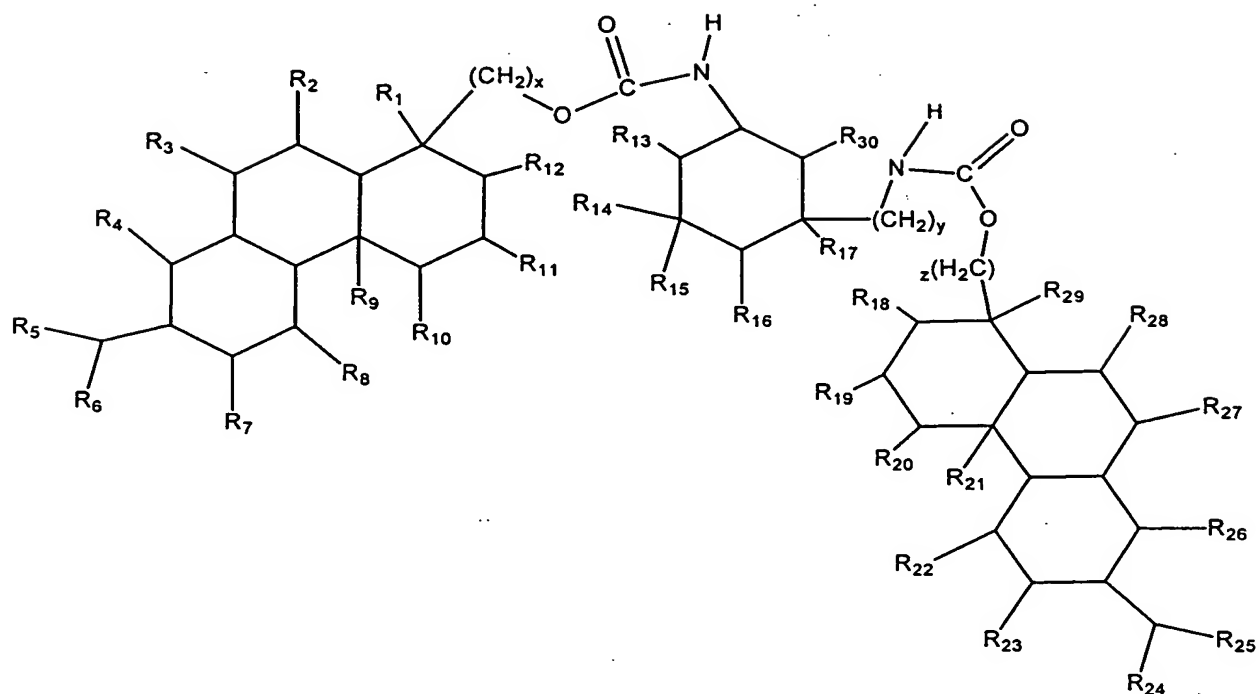
39. A phase change ink comprising:



wherein R<sub>1</sub>-R<sub>19</sub> comprise hydrogen, alkyl groups or aryl groups, and can be the same as one another or different from one another; wherein one or more of R<sub>1</sub>-R<sub>19</sub> can be comprised by a ring structure; and wherein X<sub>1</sub> comprises one or more methylene groups.

40. The phase change ink of claim 39 wherein some of R<sub>1</sub>-R<sub>30</sub> are methyl groups and some of R<sub>1</sub>-R<sub>30</sub> are not methyl groups, and wherein at least some of the R<sub>1</sub>-R<sub>30</sub> which are not methyl groups are hydrogen.

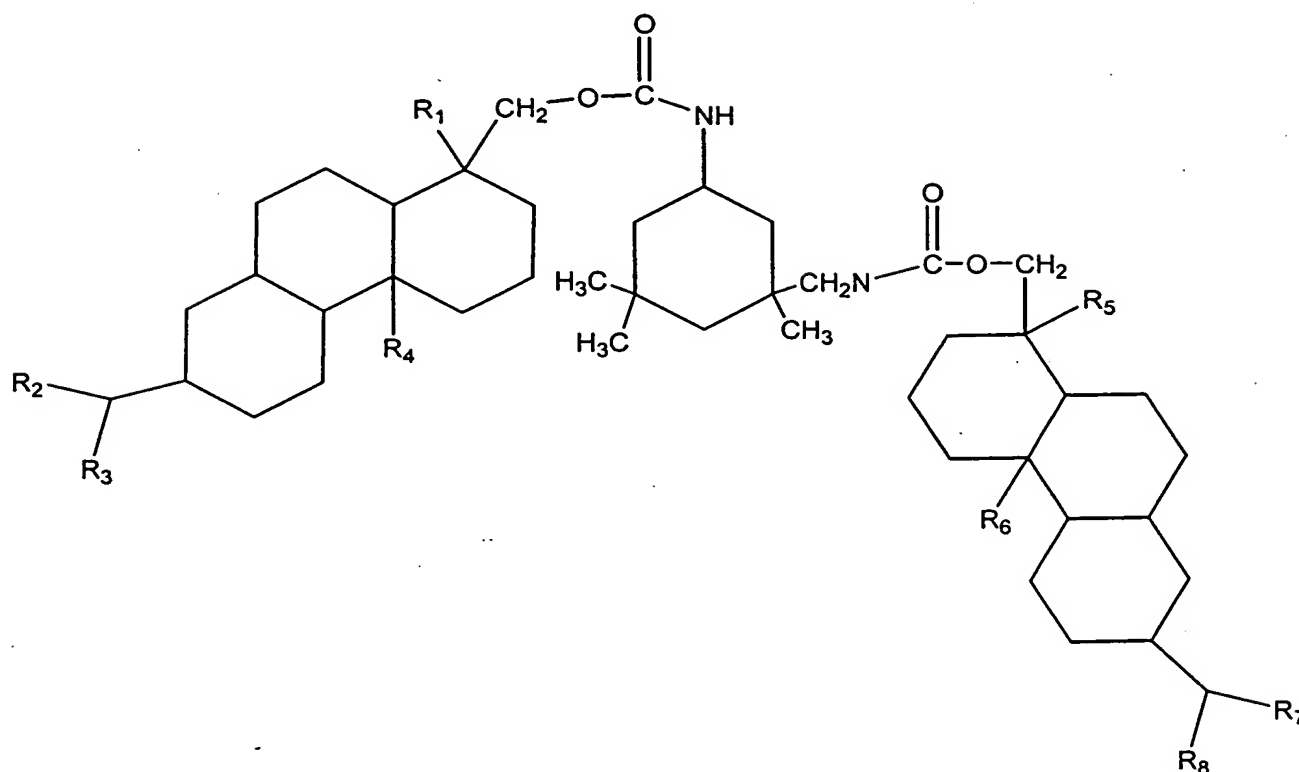
41. A phase change ink comprising:



wherein  $R_1$ - $R_{30}$  comprise hydrogen, alkyl groups or aryl groups, and can be the same as one another or different from one another; and wherein  $X_1$ ,  $X_2$  and  $X_3$  comprise one or more methylene groups and can be the same as one another or different from one another.

42. The phase change ink of claim 41 wherein at least some of  $R_1$ - $R_{30}$  are methyl groups and some of  $R_1$ - $R_{30}$  are not methyl groups, and wherein at least some of the  $R_1$ - $R_{30}$  which are not methyl groups are hydrogen.

43. A phase change ink comprising:



wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub> and R<sub>8</sub> comprise hydrogen, alkyl groups or aryl groups.

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44. The phase change ink of claim 43 wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub> and R<sub>8</sub> are methyl groups.